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on Global Issues for Development

Manual for Participatory Food System Sustainability Assessments and Transformation (FoodSAT) – Steps towards Food Democracy



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What the hell
are you looking for?

We want our
food system back!

Have you never heard
about *food democracy*?



Cartoon: Karl Herweg

1 Introduction

Welcome to our guide to Participatory Food System Sustainability Assessment and Transformation (FoodSAT). The guide offers an introduction to multidimensional assessment of food systems, based on experiences from action research carried out by scientists and practitioners from the University of Bern, Switzerland, together with their partners in food systems in Africa and South America.¹ It describes how to conduct analyses in participatory ways, how to assess the degree to which food systems are sustainable and democratic, and how interested food system actors can engage in co-designing and implementing “transformative actions” for food sustainability and democracy. The manual includes examples and illustrations from our experiences in practice.

While the objectives of participatory assessment and joint transformative actions are already clearly stated in general, it is important to remember that the FoodSAT process always starts with local discussion of goals. The aim is to ensure that there is common ground among those taking the initiative to organize such a process, including the local actors involved.

We generally begin the process by sharing the following core message with the stakeholders:

In this process, all key actors are invited to take part in democratically deciding to which ends their food systems need to transform. In other words, we will engage together in collective decision-making on how the production, processing, marketing, and consumption of food should be organized, and which quality standards should be followed. Food democracy – rather than obeying big corporations, corporate-oriented government authorities, or other powerful actors – puts the visions and needs of people first and, on this basis, defines transformative actions.

Against this background, the present manual supports people and groups who want to engage in participatory, democratic transformations of food systems towards sustainability in a practical step-by-step manner.

Concretely, this manual will whelp you, the reader, to implement FoodSAT in your own context. In chapter 2, we summarize some basic concepts, including our definitions of food system, food sustainability, and co-creation of knowledge for transformative food sustainability action and democracy. In chapters 4 and 5, we describe the steps of participatory food system sustainability transformations, namely:

- Assessing and understanding the complexity and interrelationships of food systems,
- Discussing and adapting the concept of food sustainability and democracy to the views of involved food system actors,
- Identifying levers to co-create food system transformations, oriented towards the principles of food sustainability and democracy,
- Jointly implementing food system transformations as collective action,
- Jointly evaluating and monitoring transformation in order to correct, adapt, or upscale the process.

Divided into two key overarching parts, the first part of the guide focuses on assessment of the current state of the food system, including environmental, economic, social, political, and cultural aspects. Part two focuses on transforming unsustainable, power-driven food systems, preparing the ground for application of principles of food democracy and/or strengthening and scaling up existing sustainable and democratic food systems.

¹The project “Towards food sustainability: rebuilding the coexistence of different food systems in South America and Africa”, financed by the Swiss National Science Foundation and comprising a consortium (University of Bern, Switzerland; Institute of Post-Graduate Studies of Geneva, Switzerland; COM-PAS, Bolivia; CETRAD, Kenya, Federal Rural University of Rio de Janeiro, Brazil; National University of Colombia; Millar Institute for Transdisciplinary and Development Studies, Ghana; University of Zambia) aims to provide evidence-based scientific knowledge for the development and promotion of advocacy strategies and policy options to improve the food sustainability of food systems, as well as to co-create and co-implement transformative action for more sustainable and equitable food systems.



Figure 1. Participatory food system assessment and transformation with *Fundo de pasto* communities in Casanova, Brazil. Photo: Aymara Llanque

In our own action-research experiences, we have found that it is difficult or impossible to initiate a transformative process based solely on achieving a generic common understanding of food sustainability and democracy. Instead, it is critical to identify the dimensions and related indicators in context, as we have done in a six-year research and action project on food sustainability, carried out in 13 different contexts in six different countries (Kenya, Zambia, Ghana, Bolivia, Colombia, Brazil). A short description of the different contexts, participating actors, and actions carried out in each setting can be found in the Annex.

Over the years, we have co-created a total of 56 indicators for five dimensions of food sustainability. The five dimensions are (1) **food security**, the (2) **right to food**, (3) **environmental performance**, (4) **poverty and inequality**, and (5) **social-ecological resilience**. While it may be unfeasible to discuss over 50 indicators in a participatory transformation-oriented process, we have found that the five dimensions and related indicators can serve as a valuable source of inspiration for organizers of transformative actions. They can help facilitators identify the most relevant indicators for a comprehensive participatory food system assessment in a given setting, providing a foundation for launch of the transformation process. In this way, the larger set of 56 indicators can serve as basis for selection and identification of a smaller number of highly relevant indicators, according to the views of the local actors engaged in jointly assessing and transforming their food systems.

We understand indicators as values that enable identification of gaps between the current situation of a food system and the principles of food sustainability. Depending on the setting, different indicators may be selected and used for each dimension of food sustainability. Consequently, this guide describes how the process of selection and implementation can be carried out together with those food system actors who are interested in making their food systems more sustainable.

Broadly speaking, this manual is aimed at any persons or organizations interested in sparking or promoting collective action towards food system transformations, such as public authorities, NGOs, social or political movements, cooperatives, associations of producers or consumers, private companies interested in food sustainability, and others. The manual can also be used for narrower individual actions related to food sustainability, such as workshops for analysis and planning, training-of-trainer processes, targeted evaluations (e.g. pre-post assessment), or even as a monitoring tool.

2 Why a tool for food sustainability and democracy?

Today, agricultural production and food consumption are in a state of crisis. After decades of declining, the number of people suffering from hunger is now increasing. As of 2021, the UN World Food Programme's live HungerMap counts approximately 957 million people across 93 countries who do not have enough to eat. About 239 million people urgently require life-saving humanitarian action and protection this year.² Tragically and unacceptably, every five seconds a child under five dies from lack of sufficient food. Indeed, our food systems are broken and cannot be fixed by simply producing more. As the dominant food systems rely on extensive use of non-renewable inputs (energy, fertilizers, pesticides, commercial seeds), heavy machinery, underpaid farmers and land workers, etc., we confront the following the "wicked" dilemma: In the current paradigm, the more food we produce, the higher the negative impacts are for human health, ecological sustainability, food waste, enjoyment of human rights by all citizens, and so on. At the same time, there is a dearth of decentralized, democratically organized food markets – instead, oligopolistic and monopolistic power-driven market structures dominate.

Moreover, current food systems are tied to the dispossession of indigenous populations, peasants, riverine people, afro-descendants, and many others, in particular due to the expansion of the agricultural frontier, intensification of production, and land grabbing. This especially harms women, as they are frequently in charge of food production and food processing in poorer countries. Women work more than half of all the hours worked in the world, but they only receive one third of all the income³; and they possess less than 20% of the world's land.⁴ Meanwhile, over two thirds of all people live in countries where inequality is growing. The richest 1% of the global population captures more than double the income of the poorest 50%, with inequality growing⁵ even further as a result of the COVID-19 pandemic.⁶ Climate change, urbanization, migration, and even technological innovation are all fuelling rising inequality in a variety of ways.

The environment, including the climate, is heavily impacted by our dominant food systems. Food-related activities are already overshooting at least five planetary boundaries in terms of species extinction, deforestation, climate change, nitrogen and phosphorus cycles, and ocean acidification. The average annual global temperature in 2019 was 1.1° C higher than in pre-industrial times. Based on our current trajectory of carbon emissions, we are heading for a temperature increase of 3–5° C by the end of the century. Temperature rises like this would turn large portions of current agricultural land into deserts and raise sea levels by about two meters, flooding thousands of cities and large swathes of intensively cultivated land in coastal areas, displacing millions of people.

What and how we eat also affects our personal health, of course. There are now more overweight (> 2 billion) and obese (> 600 million) people than hungry people in the world. At least 2.8 million people die each year from the consequences of obesity or overweight. These critical conditions highlight other aspects unsustainability in many food systems and point to complex problems with intertwining structural roots, which demand their own perspectives of necessary transformation.

Overall, processes of monopolization and power concentration have gradually turned food and nutrition from culturally defined common goods into profit-oriented market commodities. This has been accompanied by extensive harms to ecosystems and people's health as well as diminished opportunities to shape food systems according to different worldviews, visions, and values, by means of deliberative, democratic processes.

2.1 What is a food system?

A food system is a circle or network of activities and related actors that spans everything from food production and processing to distribution, consumption, waste management,

² See: <https://www.un.org/en/food-systems-summit/news/2021-going-be-bad-year-world-hunger>

³ United Nations Human Development Report (2015). http://hdr.undp.org/sites/default/files/2015_human_development_report_1.pdf

⁴ The World Economic Forum (2017). <https://www.weforum.org/events/world-economic-forum-annual-meeting-2017>

⁵ World Social Report (2020). <https://www.un.org/development/desa/publications/world-social-report-2020.html>

⁶ Oxfam (2021). <https://oxfamlibrary.openrepository.com/bitstream/handle/10546/621149/bp-the-inequality-virus-sum-250121-en.pdf>

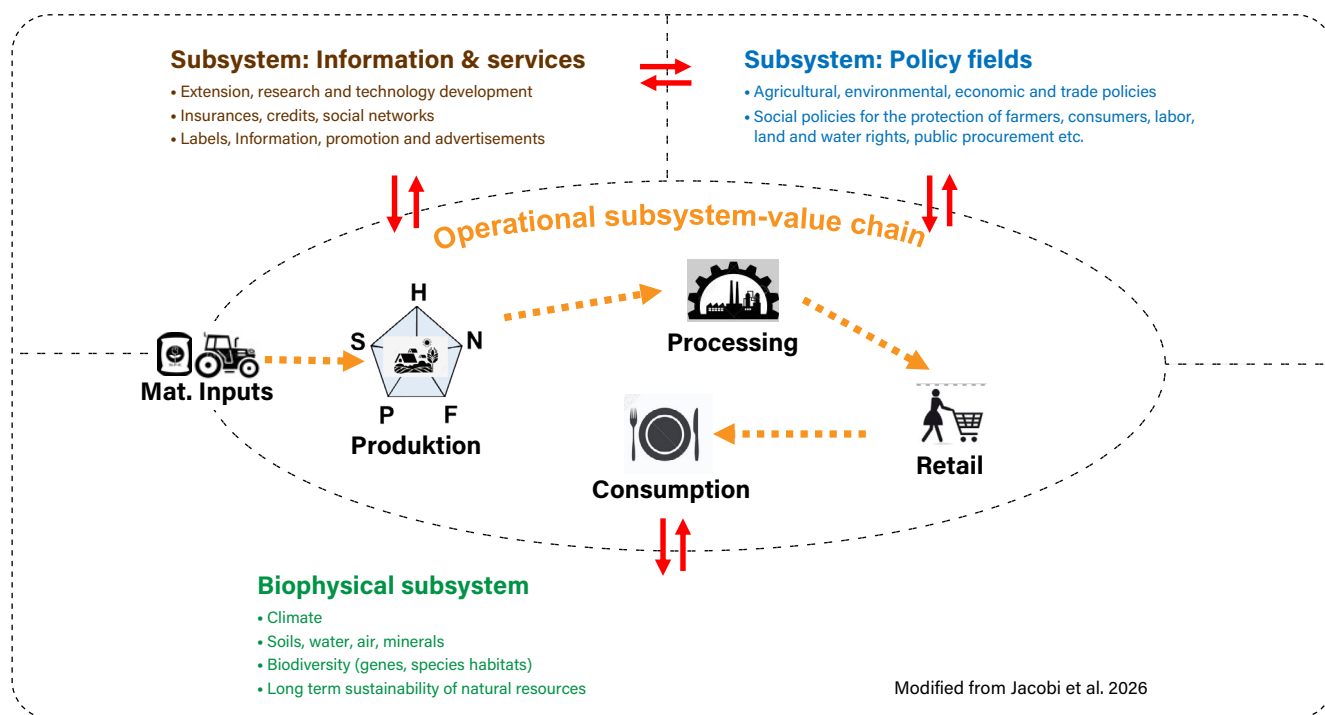


Figure 2. Food system concept.

and nutrient recycling (Figure 2). A food system depends on natural resources and is influenced by the policy context, flows of information, services, and finance. Food systems are diverse and vary, for instance, regarding the following aspects:

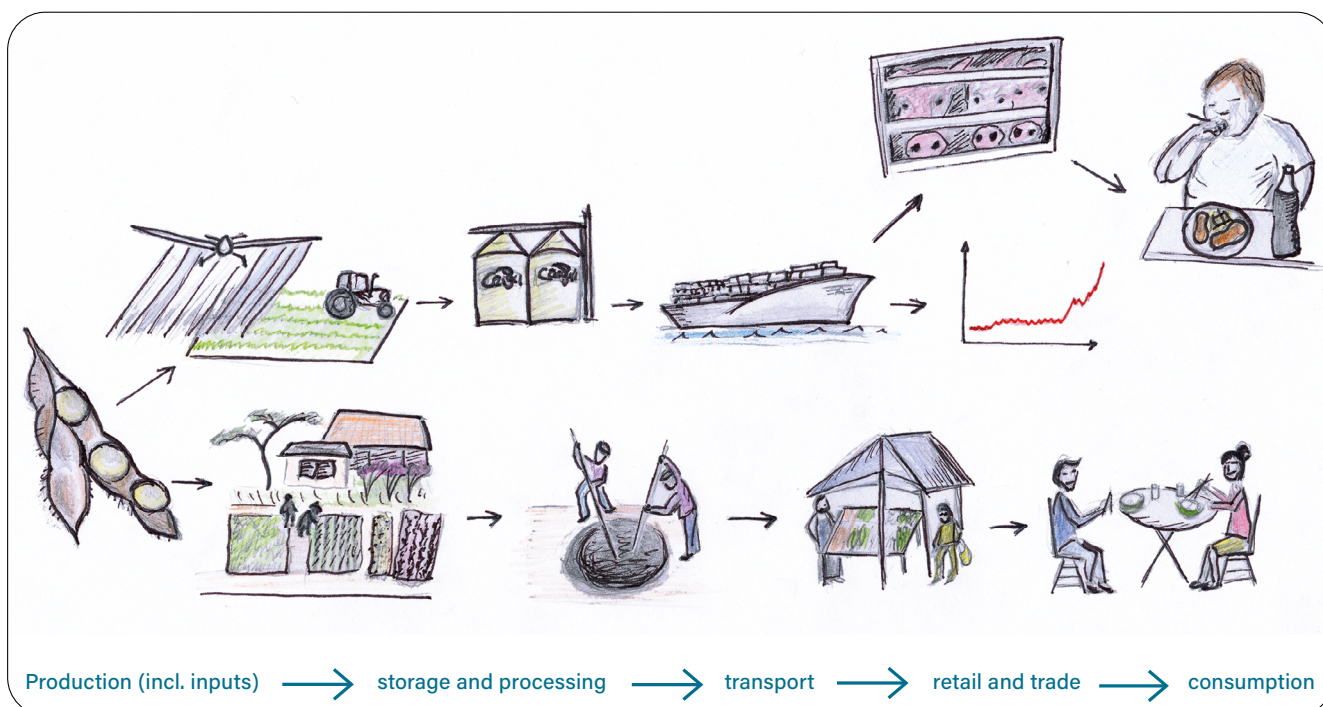
- **distance** between production, processing, and consumption;
- **participation** of actors at different stages (those who make decisions about actions);
- **modes** of production, processing, and consumption (e.g. inputs, procedures);
- **environmental impacts** (pressure on water, land, air, and biodiversity);
- **geography** (local, regional, and global).

A food system basically consists of four subsystems: First, we have the operational subsystem. It represents the value chains encompassed by a particular food system. The value chains comprise flows of goods, materials, energies, information, and knowledge, and can be traced from the production to the consumption of goods. The provision of inputs and/or the recycling of nutrients may also be included. Globally, food systems are very diverse, yet also interconnected. Accordingly, it is helpful to define the boundaries of your food system by identifying the main stakeholders involved as well as the locations and distances of flows of key inputs and outputs. Practical aspects will likely also play a role in the boundaries you determine.

Food value chains, which can also be regarded as the “operational” part of the food system, are rooted in the natural resources underlying the food system, including soils, plants, animals, water, and energy. These resources flow from nature to the value chain. At the same time, these natural resources can suffer all kinds of disturbances as a result of the value chains, such as deforestation as well as pollution of air, water, or food itself.

The operational and biophysical subsystems are related to two other subsystems: the information and knowledge subsystem out of which knowledge, information, finances, and technological innovations flow; and the policy subsystem that shapes the overall food system.

In today's dominant agro-industrial value chains, food is reduced to a commodity that obeys market logic, simultaneously undermining social or cultural modes of production, distribution, and consumption according to democratic processes and institutions. However, democratic control can still be realized, for instance, in peasant communities, cooperatives, or associations between producers, traders, and consumers, as well as



farmer co-owned processing and trading firms.

Food democracy transforms food from a commodity back into a commonly held and shared public good. In addition, food democracy articulates and upholds culturally diverse forms of knowledge, institutions, and values in decision-making processes, establishment of goals, and the day-to-day reality of food systems. Democratic food systems share the following characteristics:

- 1) Existence or ongoing creation of public spaces for deliberation
- 2) Efforts to build accountability of different food system actors
- 3) Implementation of joint decisions (what has been agreed on and needs to be done)

2.2 Participatory Food Sustainability Assessment and Transformation (FoodSAT)

We co-created the FoodSAT tool to improve understanding of different food systems and their sustainability (or lack thereof). Food sustainability is a quality that supports the continuity of life. Food sustainability includes the following five dimensions: (1) food security, (2) the human right to food, (3) reduction of poverty and inequality, (4) environmental performance, and (5) resilience – the latter meaning that the food system remains strong and functioning in the face of ecological and socio-economic stress and shocks. The FoodSAT tool uses 15 indicators linked to the five dimensions (Figure 4), which were derived from a larger set of 54 indicators. The indicators can and should be adapted according to the specific context in which the tool is implemented. This includes not only aspects of sustainability, but also of food democracy (e.g. power relations or effective participation in decision-making).

The tool and its application enable the creation of spaces for dialogue and negotiation with people involved in a food system, based on joint identification of strengths, weaknesses, opportunities, and threats.

Figure 3. Two different examples of food systems connected to soya: (1) an agro-industrial agri-food value chain extending from soybeans to pork meat; and (2) a local-traditional food system with soybeans as a basic ingredient (namely, soy sauce). The agri-food value chain spans from soybean cultivation (including inputs for production) and storage to processing, transport, retail/trade, and consumption.

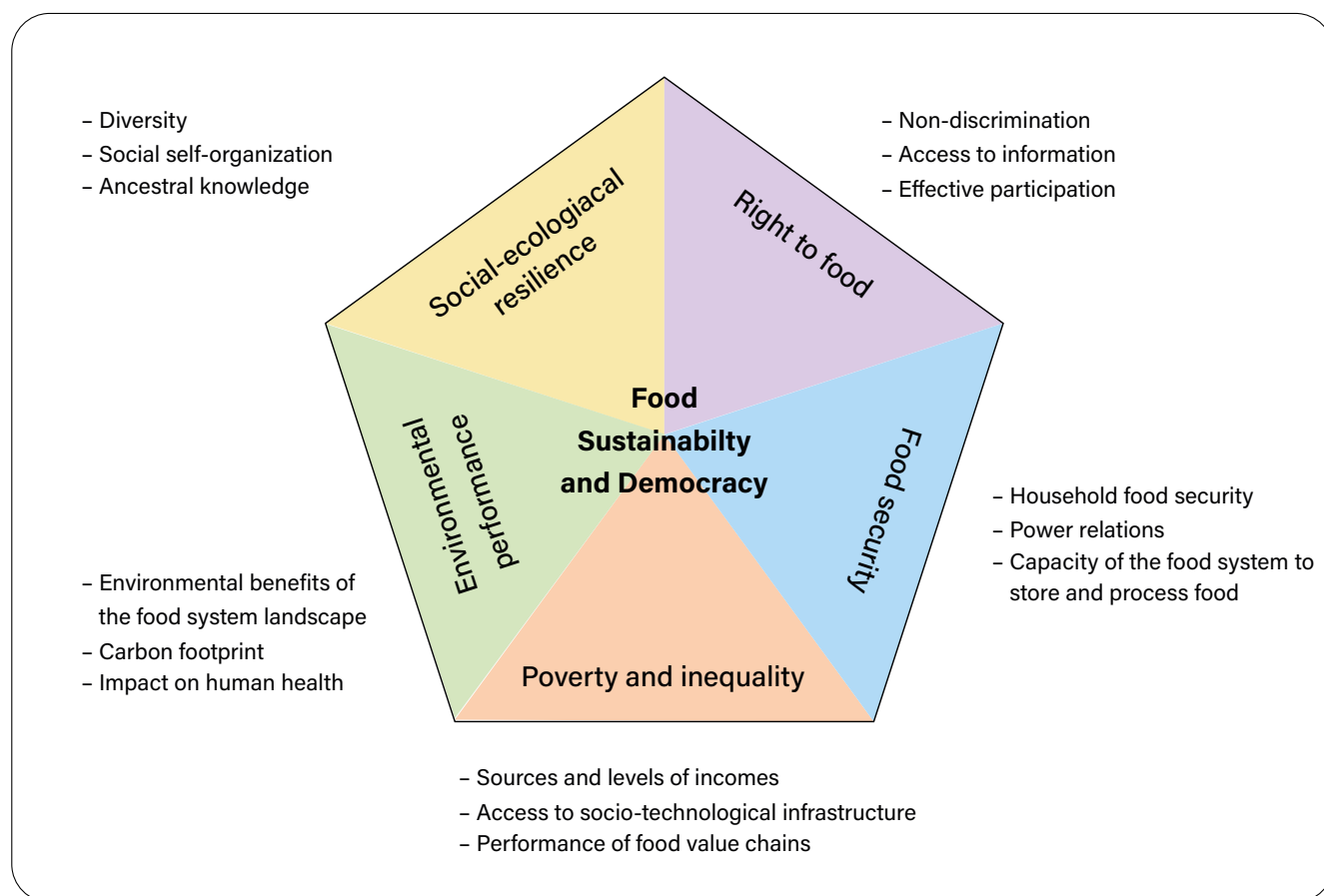
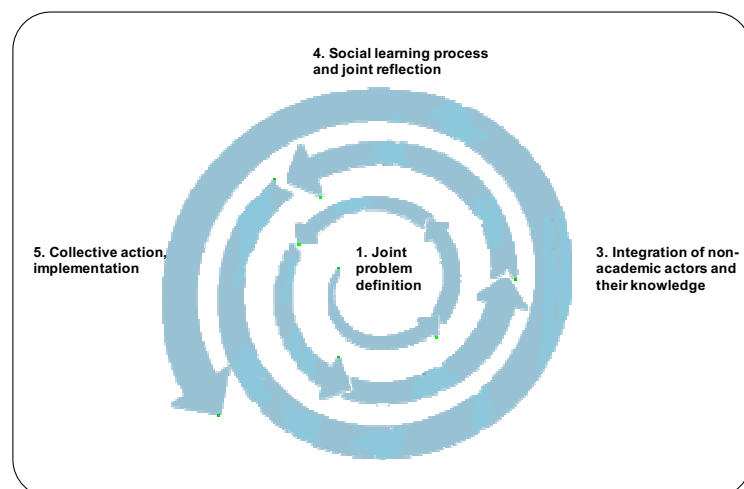


Figure 4. Five dimensions and 15 indicators of food sustainability

2.3 Co-creation of knowledge for transformative actions towards food sustainability and democracy

Transformation of food systems towards sustainability and democracy starts by recognizing the huge diversity of food-related practices and forms of knowledge, which go far beyond the dominant understanding expressed in “modern” food systems. The process of jointly assessing and transforming today’s unsustainable, often rather authoritarian food systems is one of knowledge co-creation and action, integrating the diverse knowledge of families, food artisans, processors, traders, retailers, consumers, scientific experts, NGOs, small- or medium-sized businesses, interested public authorities, and more.

Figure 5: Spiral of transdisciplinary processes of change (Rist and Herweg, 2016).



Food system transformation can be conceptualized as a spiral of change based on deliberative action research among practitioners and key actors of food systems, together with people from research, NGOs, business, or public administration. The process includes several key events or moments: (1) participatory definition of the problem; (2) integration of the natural and social sciences; (3) integration of non-academic actors and their knowledge; (4) social learning that also reflects on the meaning of “development” and (5) collective action for implementation (Figure 5).

Diagnosis of the state of the food system is a key part of the FoodSAT process and the starting point for **transformative actions**. The goal of the latter is to transform the food system towards greater sustainability and equitability.

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To date, our experience with transformative actions mainly involves the local level – including local communities, agricultural cooperatives, rural mu-

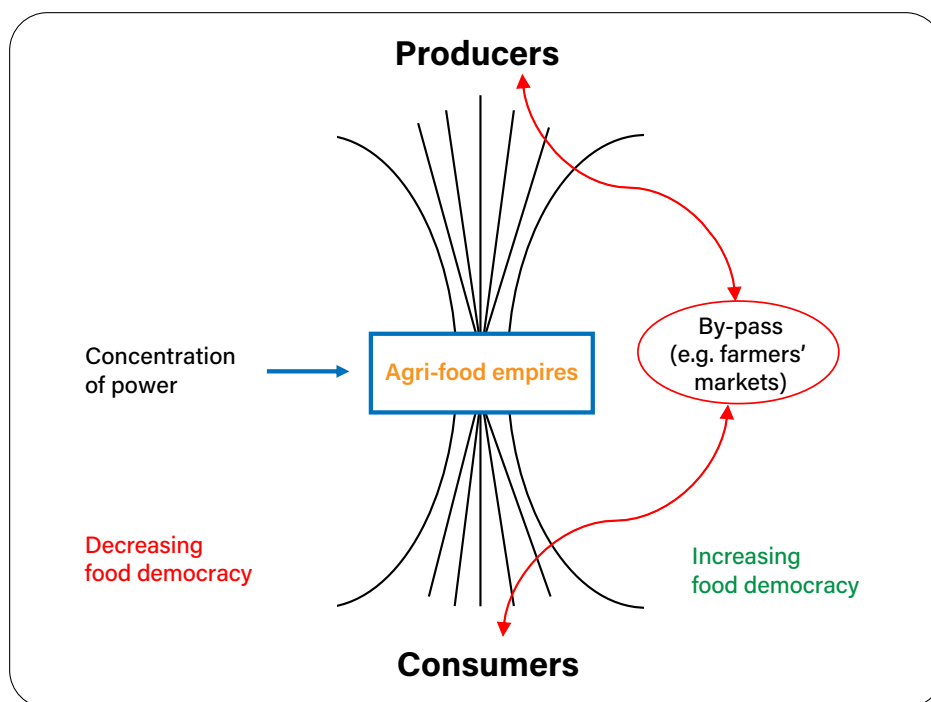


Figure 6: Vertical relationship in food systems between producers (top); traders, processors, and retailers (middle); and consumers (bottom). Power is concentrated in the middle, where a small number of commodity traders, food processors, and retailers control the lion's share of food flows. Building alternatives can reintroduce democracy into our food systems (Van der Ploeg 2018).

municipalities, and indigenous territories – as well as efforts to reach out and to scale up to municipal and national levels. However, the local level is a starting point with distinct advantages. Here, it is possible to work with those who participate directly in the food systems and discuss the changes they consider desirable. These changes have potential staying power, since they are managed by those who have a direct interest in them. Another advantage of working at the local level is the ability to recognize the limitations of activities introduced by investors or public authorities, for example formalized top-down development plans. Local-level transformations can also slow down undesirable processes and mitigate their harms, or halt them by means of social resistance.

Of course, local transformations also face challenges. Authorities often discount local-level changes as unsuited for scale-up to higher and broader levels. In this way, local actions can remain or be kept weak when they are not used as a model for policy changes at the subnational, national, or global levels. To address this relationship between local action and broader policy, it is essential to reach a consensus among interested actors in the management of food systems – only among and with them is it possible to sustain transformations over time.

In our experience with transformative actions, a common bottleneck we encounter in food systems is the concentration of power in the hands of few. This often reflects a phenomenon called “oligopoly”, in which food systems – as an economic activity – become vertically integrated and controlled by a few (usually multinational) companies, while producers and consumers are pushed to the margins of decisions and benefits. Figure 6 visualizes such concentration of power as an hourglass, with powerful traders, processors, and retailers located at the centre of the food system.

Overall, the diagnosis of a given food system is best undertaken by those who make decisions regarding production, processing, distribution, and consumption. These actors can also identify possibilities for democratization of decision-making.

Our tool can be used by any group that is interested in improving the sustainability of the food system with which they interact. Examples include community members, parents of school-age children, food vendors or preparers (e.g. cooks), NGOs, governments, scientists, and many others. Notably, application of the FoodSAT tool does not depend on the presence of scientists in your group.

3 Who can use the FoodSAT tool?

3.1 How this manual Works

FoodSAT is a participatory diagnostic process. It is not absolutely necessary to follow every step we propose in this manual. Much depends on the time needed to discuss and reach consensus – and on the characteristics of the group applying the tool. For example, more homogeneous groups such as farmers or members of a cooperative can conduct joint assessments relatively easily. If the group includes women and men, or members of local governments and indigenous communities, it may be useful to divide them into subgroups and take the necessary time to reach a satisfactory consensus all around.

The present manual also explains how – based on the FoodSAT tool – you can develop, implement and follow-up on transformative actions.

What will you have at the end of your application of the tool?

- A map of actors and the food system;
- A joint understanding of the food system in question;
- A diagnosis evaluating the five dimensions of food sustainability, e.g. in the form of a “spider graph”;
- A list of steps for a transformative action or transformation plan;
- Most importantly, you will have initiated a transformative process based on a common understanding of the food system and options for transforming it towards greater sustainability.

Before applying the FoodSAT tool, some preliminary work is required. It is necessary to do an initial scoping of the area of interest, as well as the stakeholders who may be interested. This can be done through informal contacts, a field visit, or inception studies (Step 1 provides more information on this).

Figure 7. Construction of water tanks in Samaipata, Bolivia. The transformative action was aimed at local agroecological food production. Photo: Johanna Jacobi



4 How to organize a participatory food system sustainability assessment and transformation



Figure 8. A local family farming movement in Santa Catarina, Brazil, changed laws that discriminated against traditional foods such as raw milk cheese. Photo: Johanna Jacobi

4.1 Preparing the FoodSAT workshop

Afterwards, a FoodSAT can be launched in a workshop at a convenient place and time. This requires appropriate planning and logistical preparations. In this manual, we describe the steps involved in a workshop lasting two or three days. A workshop can cover steps 2–6 of the FoodSAT, as outlined in chapter 3.

Moderation of a FoodSAT workshop requires certain skills and experience with workshop methods. The goal is to create a working environment that enables all participants to feel included and valued. Various methods can be used to “break the ice” that are not specific to FoodSAT. However, a few points are worth mentioning:

- Before starting a FoodSAT workshop, it is useful to know the composition of the participants in advance, especially in order to facilitate a transdisciplinary process that values the different types of knowledge they bring to the table. A transdisciplinary dialogue is possible and desirable between diverse actors – including academics and non-academics.
- Where possible, avoid use of terms that might produce social segregation, such as “professional” and “non-professional”, “scientific” and “non-scientific”, as well as categorization based on marital status, religious affiliation, and the like.
- Propose presentations that help to locate the actors geographically, for example according to their region, municipality, or place of origin. This helps to shed light on their role in particular value chains.
- Securing the participation of different stakeholder groups can enhance the diversity of voices and produce more resilient outcomes. A good mix might include men, women, local government representatives, community representatives, students, practitioners, and so on. Try to identify a language that unifies the group. In the case of participants who do not understand the language used for assessment, make sure that someone is responsible for translation to avoid limitations in access to information.



Figure 9. Dairy farmers in Umande, Kenya, formed a milk cooperative to process milk themselves and avoid middlemen. Photo: Boniface Kiteme

4.2 Implementing and monitoring transformative actions

Transformative actions, which have been jointly defined through democratic deliberation, are an important expected outcome of the workshop. These actions should aim to transform the food system towards greater sustainability and to involve the stakeholders in the transformation process. Overall, your workshop should help to build the basis for such transformative actions, bringing together all actors in identifying, developing, and implementing the corresponding changes. Figures 7–10 depict key moments from transformative actions carried out in our projects.

Depending on the activities envisaged, implementation and monitoring of the transformative actions can be time intensive. Monitoring can help to follow up on implementation and reorganize things where necessary. It is important to facilitate ongoing communication and exchange between different actors, including outside projects and government institutions that are likely to support the transformation.



Figure 10. Women of the Magobbo community in Zambia began community egg production to generate food and income. Photo: Elias Kuntashula

5 Steps of a FoodSAT

The FoodSAT tool comprises six steps that enable implementers to identify the current state of the food system from the perspective of the actors involved. At the same time, it enables planning of transformative actions. Oftentimes, evaluation and transformation are conceived of as two separate phases – one measuring the current state of what we want to change, and the other carrying out that change. In the present guide, we propose integrating and considering these phases together. As soon as assessment of food sustainability begins, so too starts the transformation process, as everyone involved comes together to analyse, negotiate, and plan together, from that moment onwards becoming dynamic actors of change. Table 2 presents an overview of the main steps involved.

Table 2. Overview of main steps of the FoodSAT

No.	Title	Objective(s)	Methods/tools	Time required
Step 1	Identify stakeholders, alliances, and networks for transforming the food system	<ul style="list-style-type: none"> – Definition of scale of intervention – Selection of stakeholders – Finding or building an alliance of stakeholders 	<ul style="list-style-type: none"> – Field visits – Networking – Contacts 	Depending on prior knowledge and existing contacts
Step 2	Food system mapping	<ul style="list-style-type: none"> – Analysis of food system – Definition of boundaries – Identify diversity of perspectives 	<ul style="list-style-type: none"> – Participatory mapping – Field trips 	2–3 hours; up to 3 days
Step 3	Participatory assessment of food sustainability	<ul style="list-style-type: none"> – Present concepts of food system – Refinement of food system map – Definition of indicators – Rating of indicators 	<ul style="list-style-type: none"> – Presentations – Food system map – Spider diagram – Table of pathways 	2–3 days
Step 4	Development of possible solutions	Identify and discuss possible solutions	<ul style="list-style-type: none"> – Table of solutions – Rating of solutions – Checking for “needs” of nature 	Depending on situation
Step 5	Developing, managing, and monitoring an implementation plan	Definition of actors that contribute to implementation	<ul style="list-style-type: none"> – Visualization of actors – Plan of implementation and monitoring 	Depending on situation
Step 6	Strengthening ties of the food sustainability initiative with existing social and political movements	<ul style="list-style-type: none"> – Explore options to link the initiative with other movements – Identify shared visions 	<ul style="list-style-type: none"> – Contacts – Networking 	Depending on situation

Step 1: Identify stakeholders, alliances, and networks for transforming the food system

Transformation actions demand efforts on many fronts and are more likely to be sustained over time when accompanied by a network of people, organizations, and institutions with a genuine interest in their continuation. Before launching a FoodSAT, we recommend reflecting on the following questions:

- *Is there a group of people, organizations, and institutions that desires to transform the food system towards sustainability?*
- *Are there previous and/or ongoing actions carried out by these actors to strengthen food sustainability?*
- *Were the previous actions insufficient? Is there a need for change?*

1.1 Definition of scale of intervention

- We begin at the local level by identifying local needs and initiatives. We avoid the trap of neglecting the local level and immediately seeking to scale up transformative actions with higher-level actors. This does not mean that we exclude higher-level collaboration, but rather that we recognize local actors as the key actors in democratic, sustainable food systems.
- A good example are family farmers belonging to the Magobbo community in Zambia. Because they lived next to a large sugar company, they were often overlooked by those focused on supporting sugar cultivation as an export commodity.
- To avoid starting from scratch every time, we look for existing local initiatives going in our direction. We take the time necessary to evaluate the potentials and constraints of working with any ongoing initiatives.

1.2 Selection of stakeholders

- We usually work with actors who are currently at the margins of “mainstream” decision-making in food systems, such as producer groups or consumer groups. At the same time, there are instances where the power for change lies with an economic cooperative, a community finance agency, a small food-processing company, a local government, or even a local advocacy-oriented NGO.
- People's interests and time resources are limiting factors. We recommend avoiding strictly formal representatives, and instead striving to invite actors with a real interest in food system sustainability and justice. One example are the urban farmers in the city of Sucre, Bolivia, most of whom are women. In formal events and organizations, however, they are usually replaced by their husbands, even though the latter frequently have little or nothing to do with urban agriculture in practice.

1.3 Finding or building an alliance of stakeholders

- It is important to remember that the various actors who are willing to undertake transformation actions may have different visions. We recommend exercising care when deciding on the composition of inter-institutional alliances. For example: if we wish to realize transformations that support sustainable family farming households, groupings dominated by actors who defend agribusiness on an industrial scale should likely be avoided, as they may drown out the voices of family farmers.
- We recommend taking the necessary time to build an alliance between actors interested in changes beneficial to food sustainability. Strategic alliances can be initiated by looking for common themes/problems shared by different groups of actors who have the capacity to shape conditions at the local level – and eventually other levels. Where possible, analyse possibilities of alliances between existing groups or organizations to jointly launch the process of assessment and implementation. Meet, communicate, and invite groups or organizations, remaining aware of their potential unique interests in the process.

Time needed for this step: Depends on prior knowledge and existing contacts.

Step 2: Food system mapping

In order to stimulate discussions and obtain a basic understanding of the food system, we use the technique of participatory mapping. This involves drawing – individually or as a group – a map of the land, municipality, indigenous territory, or region where we aim to support a transformation. Food system mapping consists of an initial visit to the site and identifying all the key elements related to the dynamics of food. Guiding questions include:

- *What are the conditions of the landscape? (In particular, regarding soils, air, water, and the presence or lack of agrobiodiversity.)*
- *Where are the key organizations/actors located? (Including companies, governments, and civil society members – as well as those that are often not heard, but important.)*
- *What are the dynamics between food production, processing, transformation, and consumption? Where is the food produced, transformed, marketed, and consumed? Who influences what goods, and from where?*

Active observation is fundamental to pin down important details about the food system. When those conducting an assessment are unfamiliar with a food system, they are likely to ask general, descriptive questions that help to create an initial image. However, the details necessary to accurately visualize and better understanding the food system will only truly emerge through in-depth dialogue with local experts.

Based on this, we recommend holding informal meetings and/or workshops prior to mapping in order to collectively define the possible food systems of the region, the most dominant food systems, those with less relevance – and, in particular, those that have the potential to strengthen food sustainability.

We recommend the following procedure for food system mapping:

First, draw all the communication and transportation routes (roads, rivers, etc.).

Second, draw the places where food is produced.

- *Mark where agricultural inputs can be obtained (e.g. farm stores, a particular home's yard, a neighbour's house).*
- *Mark places where intermediaries collect, store, and sell food.*
- *Include places where food is processed (e.g. company names).*
- *Draw vending centres (markets, fairs, shops).*
- *Include lenders, banks, and other sources of financing.*
- *Mark places for the consumption of food (restaurants, neighbourhood shops, street vendors).*
- *If known, indicate where imported foods come from.*

To enhance the map and strengthen its usefulness, a variety of standardized symbols and codes can be employed, including: one-way arrows to indicate movement; broken lines to signify inadequate conditions; triangles to highlight infrastructure; circles to indicate people. These are just a few coding suggestions. The important thing is to ensure that the mapping process and map itself are understandable to everyone involved. The result will be an initial map that can be shared in the evaluation process.

Figure 11 shows an example of a local food system map. Beginning at the upper left corner, we see that the inputs for agro-ecological production largely depend on government technological support. The government, in turn, purchases the genetic material from importing companies linked to multinationals.

Important tips: One of the **first** key difficulties in mapping is deciding how to define the boundaries of the food system. Because of the various interactions between levels, the borders of the system are typically fuzzy and permeable. For example, local food systems often use inputs from multinational companies, in particular because of people's reliance on external seeds. Such centralized, high-level control of plant genetic material is a core characteristic of today's global food system, and its local ramifications can be enormous.



In cases where participants voice doubts or have many questions about particular concepts, we recommend using images, drawings, and small group discussions to aid understanding and enable more voices in dialogue.

Our recommended assessment workshop steps are as follows:

- *First, hold a presentation about the programme, goals, methods, and basic concepts – e.g. food system, sustainability, democracy, sovereignty, values, and the relationship between scientific and local knowledge; follow this up with a well-targeted, didactic explanation of the meaning of the five dimensions of food sustainability and related indicators.*
- *Second, facilitate presentation, discussion, and possible refinement of the food system map, incorporating the perspectives of the workshop participants.*

Further, if it was not possible to elaborate a food system map during the preparation phase, a map can also be developed in this workshop. Sometimes, different actors have quite distinct views of the food system in question. Perspectives can vary depending on people's geographic location, gender, age, involvement in different food system activities, etc.

Should you have a large number of participants, consider breaking up and forming smaller groups, assigning each to elaborate its own map. In case of such group work, make sure to allow each group to present its own findings to the wider plenary. During the plenary, the moderators should seek to identify and articulate commonalities, differences, and shared issues of concern among workshop participants, helping to improve understanding of key problems.

- *Third, facilitate discussion of indicators for each dimension – including the replacement of existing indicators with new indicators, where applicable, if agreed upon by all participants*

Present each indicator, making sure that people can easily understand what it is about, including with the aid of drawings, images, theatre, stories, etc. If the relevance of a specific indicator is unclear, you can replace it with another one that is more adapted to the particular context. We recommend keeping the total number of indicators to 15, at most.

- *Fourth, discuss and decide on the ratings of each indicator for each dimension.*

Your collectively conceptualized indicators can be assessed according to a scale encompassing five values. We use a **0–4 scale**, with **0** meaning "none", "very low", or "very bad" and **4** meaning "ideal", "100%", "very good", or "very high". As a result, *desirable* values are always *higher* or *bigger* values. This requires care in standardization, for example in the case of carbon footprints, whereby a (desirable) small carbon footprint should be (perhaps counterintuitively) assigned a bigger value – i.e. closer to 4.

Figure 12. Workshop participants present illustrations of indicators.

Using your scale, analyse the indicators one by one with the participant group(s). We introduce each indicator and ask the participants to assign it an agreed-upon value. In case of disagreement, take the necessary time to discuss, negotiate, and adapt the assigned value as needed.

Note: It is essential to reach a democratic agreement or – if possible – consensus regarding the value assigned to each indicator. As a result, the way we present the indicators assumes particular importance.

The **right to food** refers to the respect, fulfilment, and protection of access to all the necessary conditions to feed ourselves. Countries and their regulations must guarantee non-discrimination, access to information, and access to spaces of effective participation to decide on our food.

Food security refers to ensuring stable access to safe, sufficient quality (e.g. nutrient rich, pesticide free), permanent food supplies. It also refers to sovereignty, that is, guaranteeing people the freedom to decide on their food system. It implies having opportunities to negotiate in spaces of power, and possessing the necessary means for dignified production, marketing, and consumption. Finally, it means having the capacity to save food for times of scarcity.

It is the economic conditions of food systems – ranging from production to consumption – that can produce changes in **poverty and inequality**. For example, enabling small farmers to earn more than they must spend, giving them access to adequate infrastructure and technologies, and empowering them participate in more and different links in the value chain.

The **environmental performance** of a food system refers to its ability to preserve or enhance the natural environment, including the diversity of animals, plants, living soil, clean water, and clean air. It is improved, for example, when water is conserved in water-scarce areas or when low amounts of carbon dioxide or other harmful gases are emitted. Good environmental performance positively impacts human, animal, and plant health. Poor environmental performance seriously harms health.

Resilience refers to the capacity of a system to withstand difficulties as well as to reorganize, learn, and adapt. It also refers to biocultural biodiversity, including people's rightful inheritance in terms of seeds, land, local knowledge, varieties, and dishes. Finally, it encompasses people's social organization and corresponding systems of rules.



Figure 13. Food sustainability rating in Makueni, Kenya, 2019. Photo: Aymara Llanque

Table 2. Indicators with descriptions.

Dimension	Indicator with description
Right to food	Non-discrimination between social categories (e.g. gender, age, nationality), as defined by each group; includes workload (e.g. care of children or the elderly), access to resources, and more.
	Access to information about food and the food system; includes information about traditional and/or ancestral knowledge.
	Effective participation in the elaboration of policies related to the food system; includes the contribution of local, ancestral, and traditional knowledge.
Food security	Food security at the household level with a focus on production; the household level thus serves as the base for measurement of aggregated levels of food security as well.
	Power relations and how they relate to food security in the food system. Can be analysed by traversing different value chain stages.
	Capacity of the food system to store and process food , referring to social-technological knowledge to secure integrative, post-harvest techniques (e.g. improved storage, processing, and commercialization).
Poverty and inequality	Sources and levels of income , and expenditures at the household level (farmgate prices, prices for food in markets, etc.); look for information on what this means for different groups of people in the food system. Also, consider other economic logics such as reciprocity patterns that may contribute to food security.
	Access to socio-technological infrastructure , such as irrigation, inputs for production, finance, transport, markets, storage, processing, health services, communication, education, and more (related to scientific and food sovereignty).
	Performance of the value chains, specifically related to the distribution of value generated along the value chains.
Environmental performance	Landscape management , referring mainly to vegetation, soil, biodiversity, and agrobiodiversity.
	Carbon footprint , referring to the food system and taking into consideration the whole value chain (production, processing, distribution and trade, and consumption). For example, use of energy, transport, consumption of meat, processed/unprocessed foods, etc).
	Health impacts , referring to human, animal, and plant health, and taking into account inter-and intracultural health, e.g. traditional or ancestral and local medicine, and conventional medicine.
Resilience	Buffer capacity/diversity (e.g. local plant varieties, biological and cultural diversity; diversity of products, food, income sources, knowledge, and other resources that enable innovations).
	Social self-organization : for example families, communities, trust, transparency, interest groups, reciprocity (can be in general, balanced, negative, and considering non-market logics).
	Learning and adaptation : knowledge legacy and identity, including local, ancestral or traditional ecological knowledge, structures, processes, wise persons, local experts, and the capacity for an inter-scientific dialogue of different forms of knowledge.

The discussions surrounding rating of the food system should strive for consensus. If someone disagrees with the value given, it is important to negotiate further. If a consensus emerges, for example, regarding market-related challenges, then the group might agree to focus its transformation actions on addressing these issues.

Working groups are a powerful means to enable diverse groups to share their distinct visions. Separate group efforts to plot the characteristics of a food system can provide a more comprehensive view of individual issues. Notably, it is not the same to talk about food security as it is to talk about food sustainability; by splitting up, each group can go deeper into the composition of its system and create provocative questions for discussion.

Additional tips:

- Balance your working groups to emphasize diverse voices. Consider dividing up groups according to gender, age, scale of participation, or particular interests. Such differentiation by gender or actor type can serve to illustrate diverse perspectives on the food system. Importantly, this also offers a chance to raise the voice of excluded groups.
- Differentiation of needs according to perspectives can be revealing. For example, in a workshop in Zambia, men's view of the most-pressing challenge was associated with

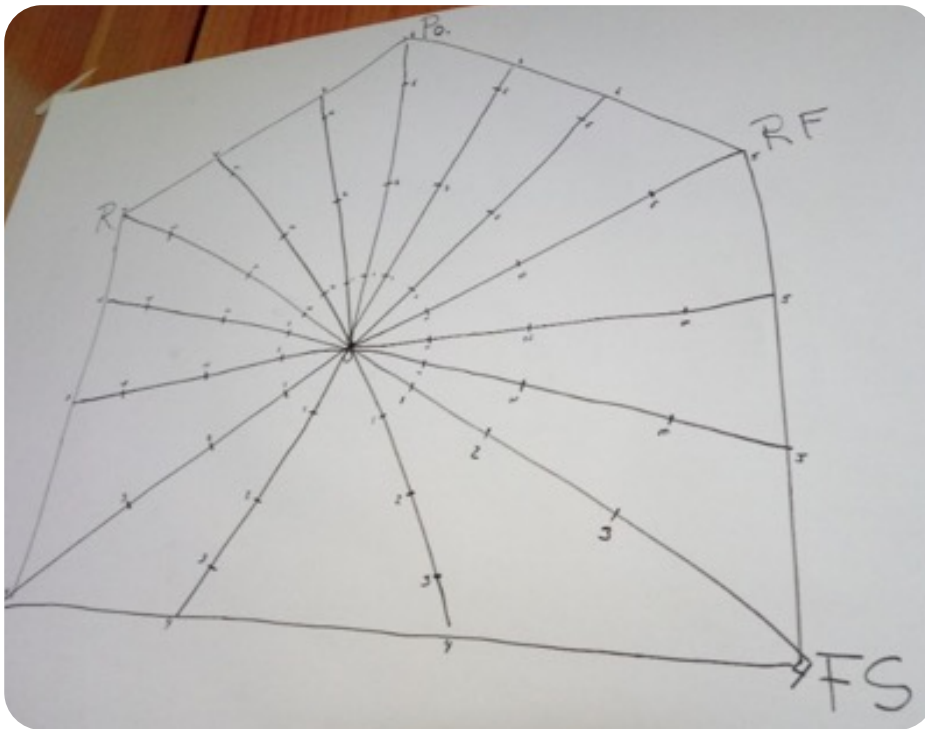


Figure 14. Example of an empty "spider" graph (prepared in advance) for use in participatory food sustainability assessment, enabling group participants to discuss and come to a consensus on scores (0–4) for each food system indicator.

sugarcane production capacity, whereas women's view was associated with production capacity for household food (self-consumption). One way to prevent discussions from growing to encompass other food systems is to delimit the area for analysis when defining the groups, for example by presenting key characteristics of the system in question.

- Importantly, assigning and visualizing group assessments of each indicator consists in placing agreed-upon values on a radial graph or "spider" graph that is shaped like a pentagon. Preparing empty spider graphs in advance will speed up the process (see Figure 14, below). Below, we show how to prepare a spider graph to start the exercise.

When facilitating group completion of the spider graph, moderators should ask the following basic question for each indicator: **What value do we want to assign and why?** Participants' arguments in favour of particular values (e.g. 0–4) can be recorded on a separate sheet of paper or in an Excel file. Once agreed upon, moderators should write the values on the spider graph for all to see.

If separate assessments are conducted in different groups, the results from each group should be integrated together at the end. The steps for this include:

- 1) To begin, you should superimpose the evaluation of each group (using different colours) on a single shared spider graph. This is much better than calculating averages, as the latter can mask key differences in perception or lived experience distinct to the individual groups.
- 2) Next, strive to identify specific strengths and weaknesses for each dimension and, if applicable, differences in interpretation according to the separate groups.

As an example: in one assessment workshop, the highest-rated indicator in the food security dimension was the capacity of the food system to store food. Men, in particular, rated this indicator highly, in contrast to the women's group who argued it was much lower. The resulting discussions of these differences revealed inequalities as well as various positive and negative aspects related to differing experiences.

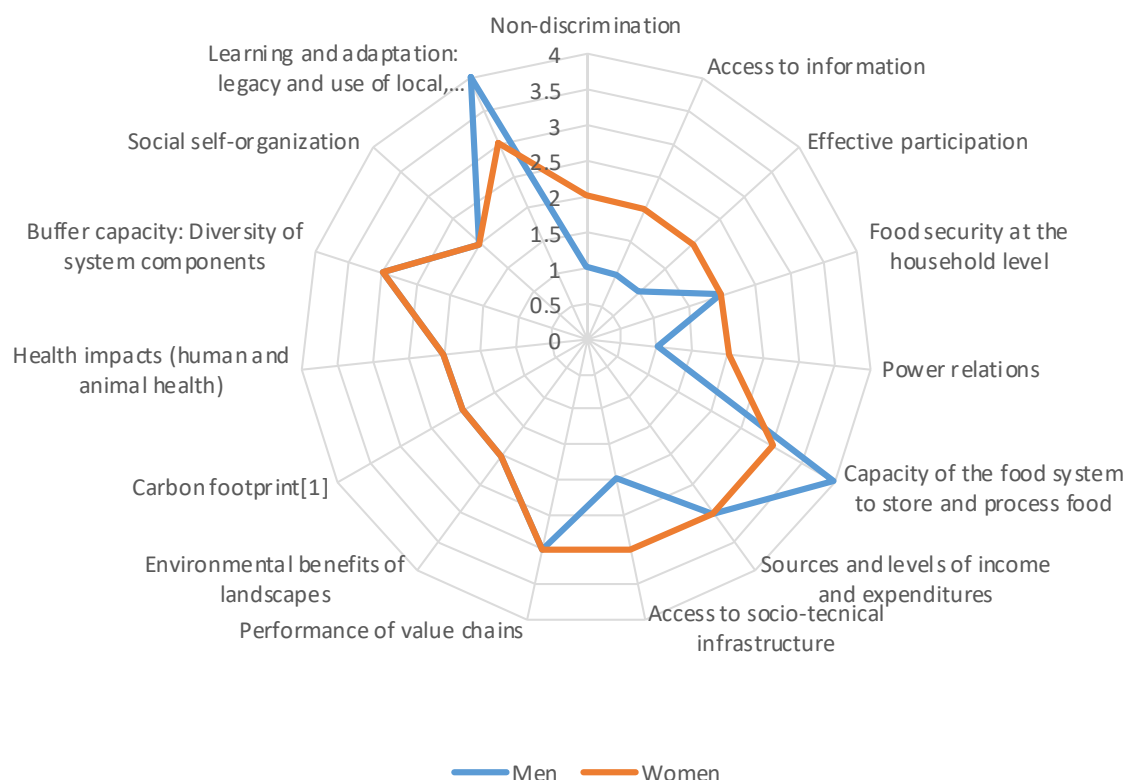


Figure 15. Example of differentiated values revealing the unique perspectives of women and men.

- 3) Afterwards, we recommend taking the final agreed-upon spider graph displaying consensus scores and discussing the problems behind two or three of the lowest-performing indicators.
- 4) The moderators can assist the group(s) in identifying reasons behind the worst-rated indicators.

To wrap up the assessment phase, we recommend that the wider plenary exclusively review the aspects **agreed upon** in the different groups – only adding comments later, if needed – so as to avoid undemocratic changes in the direction of the evaluation. It is important to stick to those issues identified in the participatory process and to avoid adopting the problem definitions of outside actors whose interests may deviate from the collective analysis achieved so far.

Finally, the overall results of the participatory assessment/problem definition can serve as the basis for identification and prioritization of **transformation actions**, taking into consideration the type of strategy, the time of occurrence, the responsible actors, and the internal control mechanisms. Table 3, below shows an example of a collective problem analysis from a workshop in Magobbo, Zambia.

Table 3. Problems identified in FoodSAT process (i.e. poor-performing indicators) and posited reasons behind them (example from Magobbo, Zambia)

Problem identified in the FoodSAT	Identified reasons
Right to food: High discrimination, low access to information, and no effective participation	<ul style="list-style-type: none"> – Lack of knowledge – Gender inequality – Mistrust and dishonesty
Poverty and inequality: Lack of access to infrastructure	<ul style="list-style-type: none"> – Financial problems – Gender inequality
Food security: Asymmetric power relations	<ul style="list-style-type: none"> – Lack of knowledge – Gender inequality

Step 4: Development of possible solutions

The main goal of this step is to identify and discuss possible solutions, with a view to transforming those aspects of the food system that have been rated especially low, and/or to enhancing well-rated aspects that can still be improved further. The basic idea is that striving to improve low-rated aspects while simultaneously considering the positive aspects of high-rated indicators can help to reveal possible pathways to more sustainable food systems overall.

The job of moderators in this step is to assist the participants in identifying solutions that appear capable of improving not just one indicator, but as many as possible. In a corresponding plenary session, the participants are asked to look for and explain the reasons behind the main problems identified; (see Table 3 above). Next, the participants are instructed to discuss and identify possible solutions for the most pressing problems (i.e. low-scoring in terms of food sustainability). In practice, it is often not only one solution that solves a given problem, but rather several solutions in combination (see Table 4).

Table 4: Finding solutions to identified problems (example from Magobbo, Zambia)

Problem identified in the FoodSAT	Identified reasons	Ideas for solutions
Right to food: High discrimination, low access to information, and no effective participation	Lack of knowledge Gender inequality Mistrust and dishonesty	<ul style="list-style-type: none"> Capacity building and dissemination – financial management, savings, etc. Women becoming proactive Women acting as unifiers
Poverty and inequality: Lack of access to infrastructure	Financial problems Gender inequality	<ul style="list-style-type: none"> Construct a community borehole to enhance access to water for irrigation Fish farming Form a group for women (social self-organization) with several activities to earn income – village banking (table banking) exists, but the women present were not in any group Focus on establishing market linkages
Food security: Asymmetric power relations	Lack of knowledge Gender inequality	<ul style="list-style-type: none"> Amend/review the norms and rules Come up with code of conduct Involve women in decision-making

After identifying the solutions, the group is instructed to rank them by level of priority according to each participant. The process continues addressing the highest-ranking solution(s).

Next, the moderators help participants in assessing the performance of the solutions selected. Key performance indicators comprise the potential contribution of each solution to ecological sustainability, equality and democratization of decision-making, economic affordability, and the length of time required to achieve benefits. In Table 5, below, an example from Zambia is provided.

Table 5. Example of solution rating with viability indicators (from workshop in Magobbo, Zambia).

Solution / intervention	Eco. sustain-ability	Equality and democratization	Technical capacity	Social-cultural acceptability	Affordability	Time to benefits	Total score	Rank	Consensus to choose two solutions
Access to inputs – specifically, borehole water for irrigation	3	3	1	3	1	3	17	2	Solution 2 Construct a community borehole to enhance access to irrigation water for own food and sellable goods (fish, vegetables)
Fish farming	3	3	1	3	1	2	16	3	
Market linkages	3	2	1	3	1	2	15	4	
Form a women-only group	3	3	2	3	3	3	20	1	Solution 1 Support women to self-organize

*Rating: 1=low, 2=medium, and 3=high

When discussing the priority and performance of different possible solutions, it is important to jointly analyse how each solution might influence other indicators (whether positively or negatively). For example, in the town of Seara in Brazil, a group implementing the FoodSAT tool decided to focus on strengthening their self-organization (resilience dimension). They found that this required simultaneously optimizing the indicators of effective participation and democratization (e.g. the right to food and food security dimensions).

In another example from Juazeiro, northeastern Brazil, participants found that improving the performance of value chains positively impacted the dimension of poverty and inequality, and also enabled the dissemination of information on healthy and local food (dimension of right to food).

Additional tip: Consideration of the “needs” of nature in transformative actions for sustainable food systems:

Often, the needs of nature are glossed over in negotiation processes, especially when economic needs are at the forefront. The FoodSAT framework values all five dimensions equally, and no food system can be considered truly sustainable when one dimension remains weak. The dimension most relevant to ecology is “Environmental performance”. Assessment of this dimension enables researchers, experts, and others to ensure – based on the knowledge of participating actors – that ecological needs are not marginalized. In addition, a subsequent crosscheck of what each intervention means for “ecological sustainability” makes certain that the environmental dimension is not neglected (see Table 5 on solution rating).

Step 5: Elaborating, managing, and monitoring an implementation plan

The main objective of this step is to define how different actors can contribute to the implementation of solutions. In particular, the participating stakeholders are encouraged to identify what they can do on their own, and where they might benefit from external support.

Creation of an implementation plan serves to emphasize that information alone cannot solve the problems of food systems. Indeed, it is necessary and desirable to create a viable management plan that will enable follow-up over time. This requires development of a strategy of action comprising specific objectives and activities aimed at implementing solutions, as well as a schedule showing key milestones. The resulting strategy should do the following:



Figure 16. A poster summarizing a FoodSAT assessment and trans-formative action in Seara, Brazil, in which rules on raw milk cheese were successfully reformed in the state of Santa Catarina, 2019.

- Visualize proposed action(s) (e.g. as in Figure 16 / Seara example, above)
- Identify key actors in the implementation of the action(s)
- Identify possibilities for public or private support of implementation activities
- Contact any actors missing from the workshop to obtain necessary information and/or secure commitments
- Sign – or organize – agreements, where applicable

We recommend that the implementation plan, defined based on the above elements, be translated into a short, understandable document that is available to everyone. In cases where the actions involve budgeting, this too should be included – as concretely as possible. This is crucial for transparency and, thus, democracy.

Proper management and monitoring of implementation will require scheduled follow-up of all actions, milestones, and agreements defined in the implementation plan.

Typically, internal monitoring is designed to identify achievements during the process, but it can also provide opportunities for (re-)adapting the direction of change.

To enable beneficial monitoring, we recommend the following:

- a) Schedule regular monitoring meetings with actors contributing to and/or benefiting from the implementation plan.
- b) Where implementation entails a detailed budget, make sure that its execution is evaluated and communicated to all participants
- c) In monitoring meetings, include discussion of the following questions: Have we achieved our objectives? What difficulties are there and what can we do to solve them?
- d) In the course of monitoring, it is important to document any and all agreed-upon adjustments.

Step 6: Strengthening ties of the food sustainability initiative with existing social and political movements

Finally, we recommend that groups implementing the FoodSAT explore options for connecting their initiative with other local, regional, and global socio-political movements. The more interconnected the action for change is, the more possibilities will open up for replication as well as incorporation of local needs and solutions into agendas at higher scales. To this end, it is important that the participants in interconnected initiatives possess:

- A shared vision
- Common interests
- Clear claims regarding what must be changed
- Clear expectations in terms of collaboration with social and political movements

Examples of related movements include those for food sovereignty, those for people's right to land and water, those working against the harms of climate change, as well as de-colonial movements and organized women's movements. Lastly, possible food movements include:

- La Vía Campesina: <https://viacampesina.org/es/>
- Coordinadora de las Organizaciones Indígenas de la Cuenca Amazónica: <https://coica.org.ec/>
- Consumers' movement: <https://www.slowfood.com/es/>
- Associated Country Women of the World: <https://www.acww.org.uk/>
- Rede Ecovida: <http://ecovida.org.br/>

6 Further reading and video links

Papers

Bessa, Adriana. 2019. The Normative Dimension of Food Sustainability: A Human Rights-Based Approach to Food Systems Governance. Towards Food Sustainability Working Paper No. 8. Bern, Switzerland: Centre for Development and Environment (CDE), University of Bern.

Bürgi Bonanomi, Elisabeth; Jacobi, Johanna; Scharrer, Bettina (2018). Food Sustainability in Bolivia Through Fair Food in Switzerland? How to Improve Food Sustainability in Both the North and the South Through Sustainable Trade Relations. *Revista Latinoamericana de Derecho Comercial Internacional*, 6(2), pp. 27-65. Universidad Nacional Autónoma de México

Jacobi J, Mukhovi S, Llanque A, Giger M, Bessa A, Golay C, Ifejika Speranza C, Mwangi V. A new understanding and evaluation of food sustainability in six different food systems in Kenya and Bolivia. *Nature Scientific Reports* 10:19145. <https://doi.org/10.1038/s41598-020-76284-y>

Jacobi J, Wambugu G, Ngutu M, Augstburger H, Mwangi V, Llanque Zonta A, Otieno S, Kiteme BP, Delgado Burgoa JMF, Rist S. 2019. Mapping food systems: A participatory tool tested in Kenya and Bolivia. *Mountain Research and Development* 39(1):R1–R11. <http://dx.doi.org/10.1659/MRD-JOURNAL-D-18-00024.1>

Llanque A, Jacobi J, Tribaldos T, Mukhovi S, Silvestre C, Tecchio A, Fernandez L, Delgado F, Kiteme B, Maluf R, Bessa A, Ifejika Speranza C, Rist R. 2021. Transformations towards food sustainability using the participatory Food Sustainability Assessment Framework (FoodSAF). *Social Innovations Journal* 5. <https://socialinnovationsjournal.com/index.php/sij/article/view/695>

Rist, Stephan; Bürgi Bonanomi, Elisabeth; Giger, Markus; Hett, Cornelia; Scharrer, Bettina; Jacobi, Johanna; Lannen, Anu (2020). Variety is the source of life: Agrobiodiversity benefits, challenges, and needs (Swiss Academies Factsheets 15 (1)). Bern: Swiss Academy of Sciences (SCNAT) 10.5281/zenodo.3568133

Videos

Step-by-step description of a FoodSAT process (in Spanish)

- 1) <https://www.youtube.com/watch?v=ArAyIYQAkLA>
- 2) <https://www.youtube.com/watch?v=jXpxoLLTB2g>
- 3) <https://www.youtube.com/watch?v=2RySHVI5w8k>
- 4) <https://www.youtube.com/watch?v=QOnAaa4svCo>
- 5) <https://www.youtube.com/watch?v=-E5e-Dt-05U>
- 6) <https://www.youtube.com/watch?v=XtjzC-V0Y2g>

7 Annex

To date, the FoodSAT guide has been applied in 13 cases in eight countries. Some of them are introduced in this manual. These include:

- In the municipality of Samaipata, Bolivia, to strengthen an ongoing irrigation project for agroecological management and local food security
- In the municipality of Seara, Brazil, to support a collective effort to change a law that discriminated against family farmers' produce in markets
- In the Umande cooperative near the town of Nanyuki, Kenya, for a mid-term diagnosis of an ongoing transformative action, as well as the definition of new opportunities
- In the village of Magobbo, Zambia, on behalf of initiatives to strengthen the community's self-organization, food security, and community governance.

Place	Topic	Timeframe
Bolivia, Sucre Municipality	Urban agroecology and women farmers	April–August 2018
Bolivia, Samaipata Municipality	Water reservoirs for the local food system	July 2018–March 2019
Bolivia, Ingre Capitaincy	Maize agrobiodiversity	February– August 2021
Brazil, Casanova (Bahia) (see also Figure 1)	Farmers' association and value chains of Fundo de pasto communities	August 2018–March 2019
Brazil, Seara Municipality	Legal discrimination of local/traditional food	March–August 2019
Colombia, Velez Municipality	Local family farms, land ownership, and local food	January 2019–December 2020
Kenya, Umande Ward	Milk cooperative	January–May 2020
Kenya, Makueni County	Community grain storage and conservation agriculture	March – November 2020
Zambia, Magobbo Village	Female entrepreneurship and food sovereignty with community gardens and fish ponds	May 2019 – December 2020
Ghana, Kalbeon village	Women processing grains	April – September 2018
Ghana, Gworie-Kunkwa village	Organic community garden	April – September 2018
Nigeria, Ibadan	Only FoodSAT assessment, to date, in the context of the Food Systems Caravan project ⁷	November 2019
Switzerland, City of Bern	Food waste, zero-package stores	January 2018 – December 2019

⁷<https://foodsystemscaravan.org/>

This publication presents a step-by-step guide to facilitation of participatory learning processes for transformation of food systems towards greater food sustainability and democracy. It emphasizes integration of diverse actors who are frequently excluded from decision-making over the food systems they belong to or participate in. It is meant to enable local actors to engage in an emancipatory process of food system design.